

November 27, 2013

Mr. Russell H. Fish
Office of Remediation 3LC20
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

*Copy entire
Report
except Appendix
C*

**RE: TRANSMITTAL –INTERIM REMEDIAL MEASURE COMPLETION REPORT
UPPER SLUICeway
GENERAL CHEMICAL CORPORATION / HONEYWELL INTERNATIONAL INC.
DELAWARE VALLEY WORKS FACILITY - CLAYMONT, DELAWARE
DOCKET NO. RCRA-3-089CA**

Dear Mr. Fish:

On behalf of General Chemical Corporation (General Chemical) and Honeywell International Inc. (Honeywell), Cummings/Riter Consultants, Inc. (Cummings/Riter), a Woodard & Curran company, is hereby transmitting 3 copies of the subject document.

Please contact me at (412) 241-4500 if you have questions or comments.

Sincerely,
Cummings/Riter Consultants, Inc.
A Woodard & Curran Company



Patrick F. O'Hara, P.E.
Senior Vice President

PFO/dat
Project No. 360.23/01
Attachments

pc: Mr. Lawrence Matson – Delaware Department of Natural Resources and Environmental Control
Mr. Steve Coladonato – Honeywell International Inc.
Mr. Rob Savarese – General Chemical Corporation
Dean Calland, Esq. – Babst Calland
Nelson Johnson, Esq. – Arnold & Porter
Mr. Richard Karr, P.G. – AMEC Environment & Infrastructure, Inc.



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Company**

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Interim Remedial Measure Completion Report Upper Sluiceway

Delaware Valley Works Facility
6300 Philadelphia Pike
Claymont, Delaware

Docket No. RCRA-3-089CA



**A Woodard & Curran
Company**

**Project No. 360.23/01
Delaware Valley Works
November 22, 2013**

General Chemical

90 East Halsey Road
Parsippany, NJ 07054
(973) 515-0900



I certify that the information contained in the report identified below is true, accurate, and complete.

**Interim Remedial Measure Completion Report
Delaware Valley Works Facility
6300 Philadelphia Pike
Claymont, DE
Docket No. RCRA-3-089CA**

As to the portions of this report for which I cannot personally verify their accuracy, I certify under penalty of law that this report and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____

A handwritten signature in black ink, appearing to read "Rob Savarese", written over a horizontal line.

Name: _____

Robert Savarese

Title: _____

Director EHS

Date: _____

November 22, 2013

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1. INTRODUCTION

On behalf of General Chemical Corporation (General Chemical) and Honeywell International Inc. (Honeywell), Cummings/Riter Consultants, Inc. (Cummings/Riter), a Woodard & Curran company, has prepared this Interim Remedial Measure Completion Report (Completion Report) for the upper sluiceway at the former General Chemical Delaware Valley Works Facility property located in Claymont, Delaware (the Site) (Figure 1). The purpose of this work was to mitigate the potential impacts to the Delaware River by a combination of source material removal and isolation of the upper sluiceway base.

Mobile Dredging and Pumping Company (Mobile Dredging) was selected to perform the upper sluiceway remedial operations in accordance with the Upper Sluiceway Interim Remedial Measure (IRM) Work Plan and IRM Work Plan Addendum No. 1 (Anchor QEA 2012 IRM Work Plan) approved by the U.S. Environmental Protection Agency (USEPA). The Anchor QEA 2012 IRM Work Plan was developed in response to the USEPA Administrative Order described in Docket No. RCRA-3-089CA. Soft sediment removal operations were conducted as described in Mobile Dredging's Site-specific work plan, Upper Sluiceway Sediment Removal & Cover Placement at the General Chemical Delaware Valley Works Facility, Claymont, Delaware (Contractor Work Plan), submitted to USEPA on November 21, 2012. Work at the Site began in December 2012 and was completed in June 2013. Inclement weather and previously unknown subsurface conditions were encountered during the completion of this interim remedial measure.

The objective of this Completion Report is to document the performance and completion of this component of the interim remedial measure. These activities have been conducted in accordance with the USEPA-approved IRM Work Plan and addendum.

This Completion Report is organized as follows: Section 2 provides a scope of work; Section 3 summarizes Site activities; Section 4 describes the performance of the work; Section 5 describes the off-Site disposal of source material; and Section 6 provides a summary of the overall project.

2. SCOPE OF WORK

The scope of work consisted of removing soft sediment from the upper sluiceway and the subsequent installation of a cover system over the sluiceway base. The upper sluiceway is defined as the portion of the Site storm water conveyance system from the storm water confluence box to the existing weir structure. The "L"-shaped confluence box and upper sluiceway channel is approximately 620 feet long (with the confluence box accounting for approximately 100 feet) and approximately 12 feet wide (the actual sluiceway width varies throughout the work area) with approximately 105 feet of the system consisting of a subsurface concrete pipeline located beneath the roadway/railroad crossing immediately downstream from the confluence box (Figure 2). The scope of work included dewatering and flow control/diversion of the upper sluiceway, debris removal, removal and solidification of sediment from the subsurface concrete pipeline and subsequent video inspection, removal and solidification of soft sediment from the remaining portions of the upper sluiceway, and the placement of a geotextile fabric (Mirafi 160N material) and minimum 6-inch thick AquaBlok® layer (Figure 3) throughout the open channel portion of the upper sluiceway. The excavation of the soft sediment⁽¹⁾ was considered complete once competent material was encountered that provided a suitable, stable base for the placement of the cover system.

⁽¹⁾ See Section 4.1 for the criteria for completion of soft sediment removal.

3. SITE ACTIVITIES

The scope of work was completed between December 2012 and June 2013 and included dewatering and flow control/diversion of the upper sluiceway, debris removal, removal and solidification of sediment from the subsurface concrete pipeline and subsequent video inspection, removal and solidification of soft sediment from the remaining portions of the upper sluiceway, and the placement of a geotextile fabric and minimum 6-inch thick AquaBlok® cover throughout the upper sluiceway. Photographs documenting the various stages of work are included in Appendix A. Mobile Dredging was the contractor selected to complete these remedial activities, and a description of each item identified in the scope of work is described in further detail below.

Dewatering Activity: Mobile Dredging isolated the storm water system by plugging the active storm water lines immediately upstream of the confluence box and diverting the storm water flow by pumping it (after treatment) to a point in the sluiceway downstream of the weir and the active work area (Figure 2). This work was initiated on December 3, 2012. Prior to discharge back into the sluiceway, the storm water was pumped through a set of 50 and 5 micron filter units and into frac tanks staged next to the storm water treatment building. The diverted flow was then pumped to the storm water treatment building where it was treated, as needed, to achieve compliance with the facility's National Pollutant Discharge Elimination System permit. The treated storm water was then discharged back into the sluiceway. The dewatering effort also included pumping water from the confluence box and sluiceway on an as-needed basis where water entered the active work areas. Dewatering activities were required on an ongoing basis during remedial activities.

Debris Removal: Debris was removed from the confluence box and from the entrance to the subsurface concrete pipeline. Debris removal was performed in April and May 2013.

Subsurface Concrete Pipeline Cleanout and Video Inspection: Water jetting was used to clean the subsurface concrete pipeline, and a vacuum truck was used to remove the sediment as it accumulated at the end of the concrete pipeline. Upon completion of the cleaning effort, a video inspection was completed using an unmanned track crawler which entered the downstream end of the pipe and inspected the pipe in an upstream direction. The video inspection revealed a partially collapsed area in the pipe approximately 25 feet in length, approximately 74 feet from the opening at the downstream end (Figure 2). Material remained in the subsurface concrete pipeline beginning at approximately 66.5 feet from the downstream opening and increased in quantity approaching the collapse. The material appeared to consist mostly of gravel and appeared to be substantially free of soft sediment. The video inspection was terminated at the location of the collapse due to the obstruction created by the material remaining in the pipe.

According to the Site maintenance manager, the area above the collapsed pipeline has previously been filled with railroad ballasts as part of periodic railway maintenance operations in order to maintain track elevation. It appeared from inspection at either end that the collapsed concrete pipe and a portion of the additional placed ballast have filled the collapsed pipeline. Although this material has created a physical blockage, sufficient voids remain to allow water to flow through the collapsed section of pipe.

The video inspection was abandoned at the location of the collapse due to the obstruction created by the material remaining in the pipe. The video showed that the concrete pipe was cleared of visible debris and sediment, to the best extent practical. Based on the current conditions of the collapsed pipe, full clearance of debris and sediment from within the storm water conveyance would require reconstruction of an underground culvert below the rail tracks and interruption of rail operations which is beyond the scope of this interim remedial measure. The IRM Work Plan

modifications are described in the USEPA-approved IRM Work Plan Addendum No. 1. The subsurface concrete pipeline cleanout was completed on April 29 and 30, 2013, and the video inspection was completed on May 1, 2013. The subsurface concrete pipe inspection video is included on compact disc in Appendix B.

Soft Sediment Removal Activity: Soft sediment removal activities (Figure 2) were completed by using a combination of heavy equipment (i.e., excavator and skid-steer loader) and manual techniques (vacuum, water jetting, and hand scraping). After selected crossbeam supports were removed from the sheetpiled portion of the sluiceway and the sluiceway was sufficiently dewatered, the excavator was used to expose competent material just below the downstream end of the subsurface concrete pipeline and the skid-steer was placed in the sluiceway. Thereafter, soft sediment was relocated using the skid-steer to a location in the sluiceway where the excavator could remove the sediment from the sluiceway and place it in rolloff containers. The soft sediment was stabilized/solidified by the addition of a super absorbent polymer (SAP), ZapZorb® prior to removal from the sluiceway.

The excavation and removal of the soft sediment was considered complete once competent material was encountered that provided a stable bottom for the placement of the cap (cover system). After the competent material was encountered through the main portion of the sluiceway, sediment removal from the corrugated sheetpile sidewalls was completed using water jetting and hand scraping techniques.

Previously unknown conditions were encountered during the removal of soft sediment from a section of the sluiceway near the lower road crossing where concrete abutments support a bridge crossing. When soft sediment removal was attempted in this section, wooden cross-members were encountered that extended across the sluiceway at the base of the concrete abutments beneath the sediment. The wooden cross-members provided structural stability, and it was determined that they must remain in place. Steel cross-members were installed upon the completion of soft sediment removal and cover system installation in order to maintain the structural integrity of the concrete abutments. In addition, the extent of soft sediment in this area exceeded what had been anticipated, and competent material for the cover system was not encountered.

The soft sediment removal methodology was adjusted to address these new conditions and additional structural bracing was installed throughout this section due to safety considerations. A vacuum truck was used to "over-excavate" the soft sediment. A controlled density fill (CDF) was then placed by pumping in the "over-excavated" areas and, as described in the IRM Work Plan Addendum No. 1, around the wooden cross-members (Figure 2). The CDF was placed to the top of the existing wooden cross-members in order to provide a suitable, stable base for the AquaBlok® cover system. The use of CDF was a modification to the IRM Work Plan and is described in the IRM Work Plan Addendum No. 1.

Transportation and Disposal of Removed Material: Upon stabilization of soft sediment material in the sluiceway, it was removed and placed into rolloff containers which were stored on Site until they were transported to the disposal facility. Transportation and disposal details are discussed further in Section 5 of this report.

Cover System Installation: Upon completion of the soft sediment removal and the establishment of a suitable, stable base throughout the open-channel portion of the upper sluiceway, a geotextile fabric was placed on the bottom surface and at least 6 inches up the sidewalls along the length of the upper sluiceway except within the subsurface concrete pipeline. After the geotextile fabric was installed, a minimum 6-inch thick AquaBlok® cover was placed on top of the geotextile fabric throughout the upper sluiceway (Figure 3) except for within the subsurface concrete pipe. The cover system was installed on April 24, 2013 (confluence box) and on May 21 and 22, 2013 (remaining area between the weir and the downstream end of the subsurface concrete pipeline).

4. PERFORMANCE CRITERIA

4.1 SOFT SEDIMENT REMOVAL

All soft sediment was removed by methods described in Section 3 of this Completion Report. Verification of soft sediment removal is described in the Anchor QEA 2012 IRM Work Plan. The soft sediment removal performance criteria are defined as:

"Removal completion shall be verified by probing the sluiceway bottom as well as visually confirming the removal of soft sediment. When all soft sediment has been removed and what remains constitutes hardpan material, the sediment removal shall be deemed completed."

Probing of the sluiceway bottom was done with a Crane Surveyors Series (SVR) surveyor leveling rod, excavator bucket, and skid-steer. The performance criteria for soft sediment removal was deemed satisfied by Mobile Dredging and verified in the field by the team's environmental consultant, AMEC Environmental & Infrastructure, Inc. (AMEC).

4.2 SUBSURFACE CONCRETE PIPELINE CLEANOUT

As specified in the IRM Work Plan, a video survey was performed in the underground culvert below the rail tracks following jet cleaning operations to verify that an acceptable cleanout had been completed. The video inspection was completed with an unmanned track crawler which entered the downstream end of the pipe and inspected the pipe in an upstream direction. The video inspection identified a collapsed area in the pipe approximately 25 feet in length, approximately 74 feet from the opening at the downstream end. Material remained in the subsurface concrete pipeline beginning at approximately 66.5 feet from the downstream opening and increased in quantity approaching the collapse. Based on the current conditions of the collapsed pipe, full clearance of debris and sediment from within the storm water conveyance would require reconstruction of an underground culvert below the rail tracks and interruption of rail operations which is beyond the scope of this interim remedial measure.

4.3 COVER INSTALLATION

As specified in the IRM Work Plan, a geotextile fabric was placed on the bottom and at least 6 inches up the sidewalls throughout the length of the upper sluiceway following the completion of sediment removal activities except for within the subsurface concrete pipeline. The geotextile fabric was then overlain by a minimum 6-inch layer of AquaBlok®. The 6-inch thickness requirement of the AquaBlok® cover was confirmed throughout the length of the upper sluiceway where the AquaBlok® was placed by visual inspection of sidewall markings made at 6 inches and 12 inches above the stable sluiceway bottom prior to the start of placement operations. The two marks were used to verify that the minimum 6-inch AquaBlok® thickness was provided throughout the open portion of the upper sluiceway. The 12-inch mark was made to identify the locations of the 6-inch marks because once the appropriate cover thickness was placed, the 6-inch marks were no longer visible. The 6-inch and 12-inch marks were made by Mobile Dredging and verified by a representative of AMEC prior to placement of the AquaBlok®.

5. OFF-SITE DISPOSAL

As mentioned in Section 3, soft sediment was stabilized/solidified with an SAP prior to being placed into rolloff containers. The rolloffs were then covered and transported to a staging area where they were stored until being transported to the designated Waste Management facility. The stabilized sediment and debris was disposed as residual (non-hazardous) waste at the Waste Management facility under Waste Profile No. 477973PAE. The designated Waste Management disposal facility was the Grows North Landfill located at 1000 New Ford Mill Road in Morrisville, Pennsylvania. Waste was also disposed at the Waste Management Tullytown Landfill in Morrisville, Pennsylvania. Waste disposal documentation is included in Appendix C. The total amount of waste disposed over the course of the project was 856.76 tons.


6. SUMMARY

The purpose of this portion of the interim remedial measure was to mitigate the potential release of source material into the lower sluiceway and the Delaware River through a combination of source material removal and cover of the upper sluiceway. Mobile Dredging began work at the Site in December 2012 and completed work in June 2013. Delays due to inclement weather and previously unknown subsurface conditions were encountered during the completion of this interim remedial measure.

The scope of work included dewatering and flow control/diversion of the upper sluiceway, debris removal, removal and solidification of sediment from the subsurface concrete pipeline and subsequent video inspection, removal and solidification of soft sediment from the remaining portions of the upper sluiceway, and the placement of a geotextile fabric and at least a 6-inch layer of AquaBlok® throughout the upper sluiceway.

Work was completed as described in the IRM Work Plan and addendum approved by the USEPA.

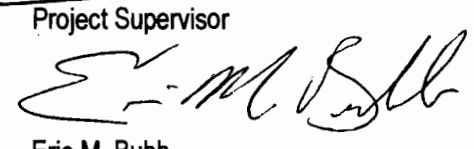
Respectfully submitted,
Cummings/Riter Consultants, Inc.
A Woodard & Curran Company



Patrick F. O'Hara, P.E.
Senior Vice President



Christine R. Kuzmowski, P.E.
Project Supervisor



Eric M. Bubb
Project Scientist

PFO/CRK/EMB/dat
Project No. 360.23/01
Attachments

FIGURES



0 2000 4000 FEET

USGS 7.5-MIN TOPOGRAPHIC QUADRANGLE
MARCUS HOOK, PA-NJ-DE, DATED 1993
SCALE 1:24000.

USGS 7.5-MIN TOPOGRAPHIC QUADRANGLE
MARCUS HOOK, PA-NJ-DE, DATED 1993
SCALE 1:24000.

FACILITY LOCATION MAP

GENERAL CHEMICAL CORPORATION
DELAWARE VALLEY WORKS
CLAYMONT, DELAWARE

PREPARED FOR
GENTEK, INC.
PARSIPPANY, NEW JERSEY

**CUMMINGS
RITER
CONSULTANTS, INC.**

DRAWING NUMBER
03360A11

DRAWN BY: T.N. Fitzroy

DATE: 10-09-13

CHECKED BY: *E.M. Bubb*

DATE: 11-21-13

APPROVED BY: *P.F. O'Hara*

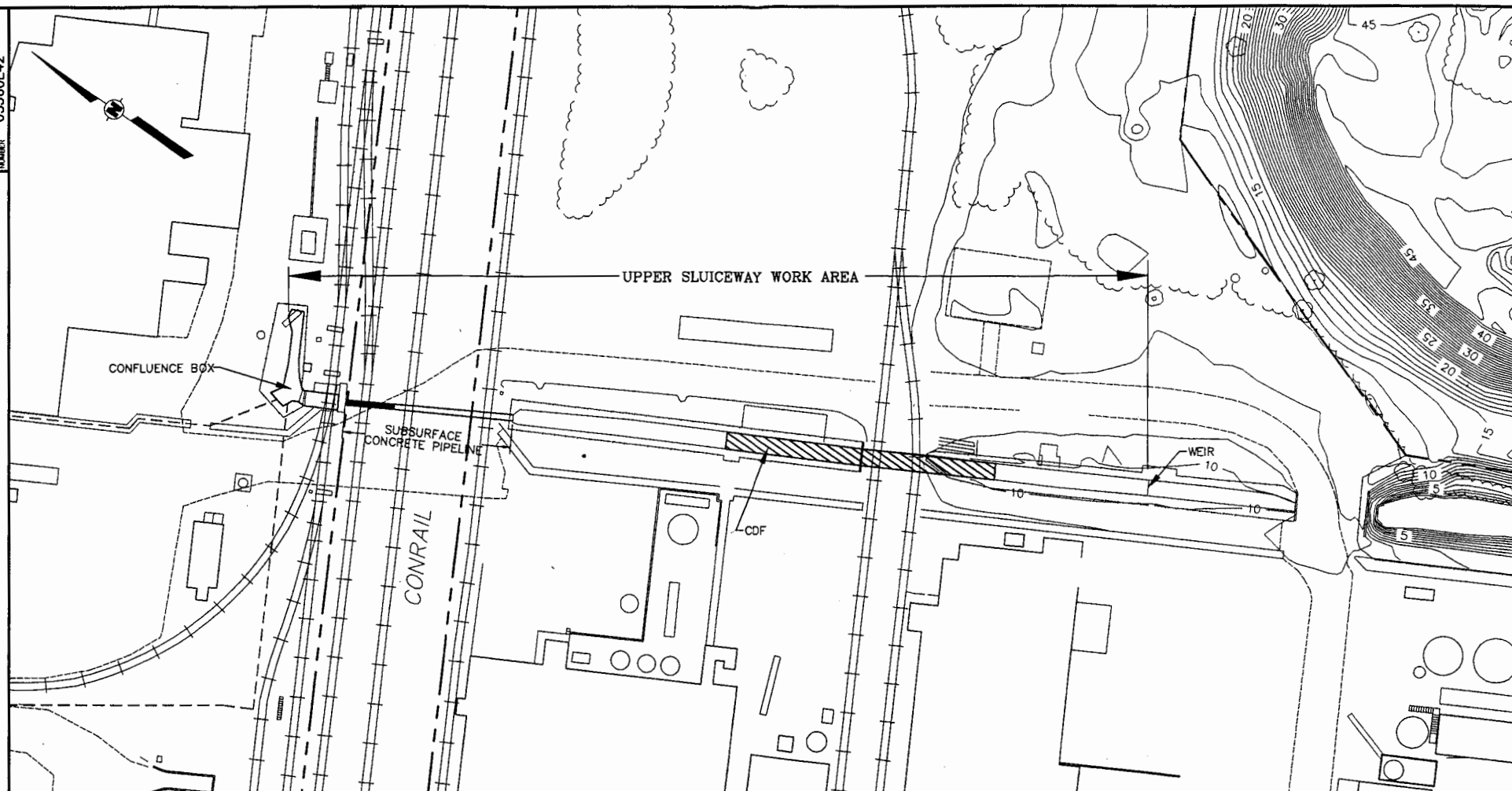
DATE: 11-21-13

			DRAWN BY: <i>T.N. Fitzroy</i>	DATE: <i>10-09-13</i>
			CHECKED BY: <i>E.M. Bubb</i>	DATE: <i>11-21-13</i>
REVISION	DATE	DESCRIPTION	APPROVED BY: <i>P.F. O'Hara</i>	DATE: <i>11-21-13</i>

03360E42

DRAWING NUMBER

POST SCALE: 1"=1'

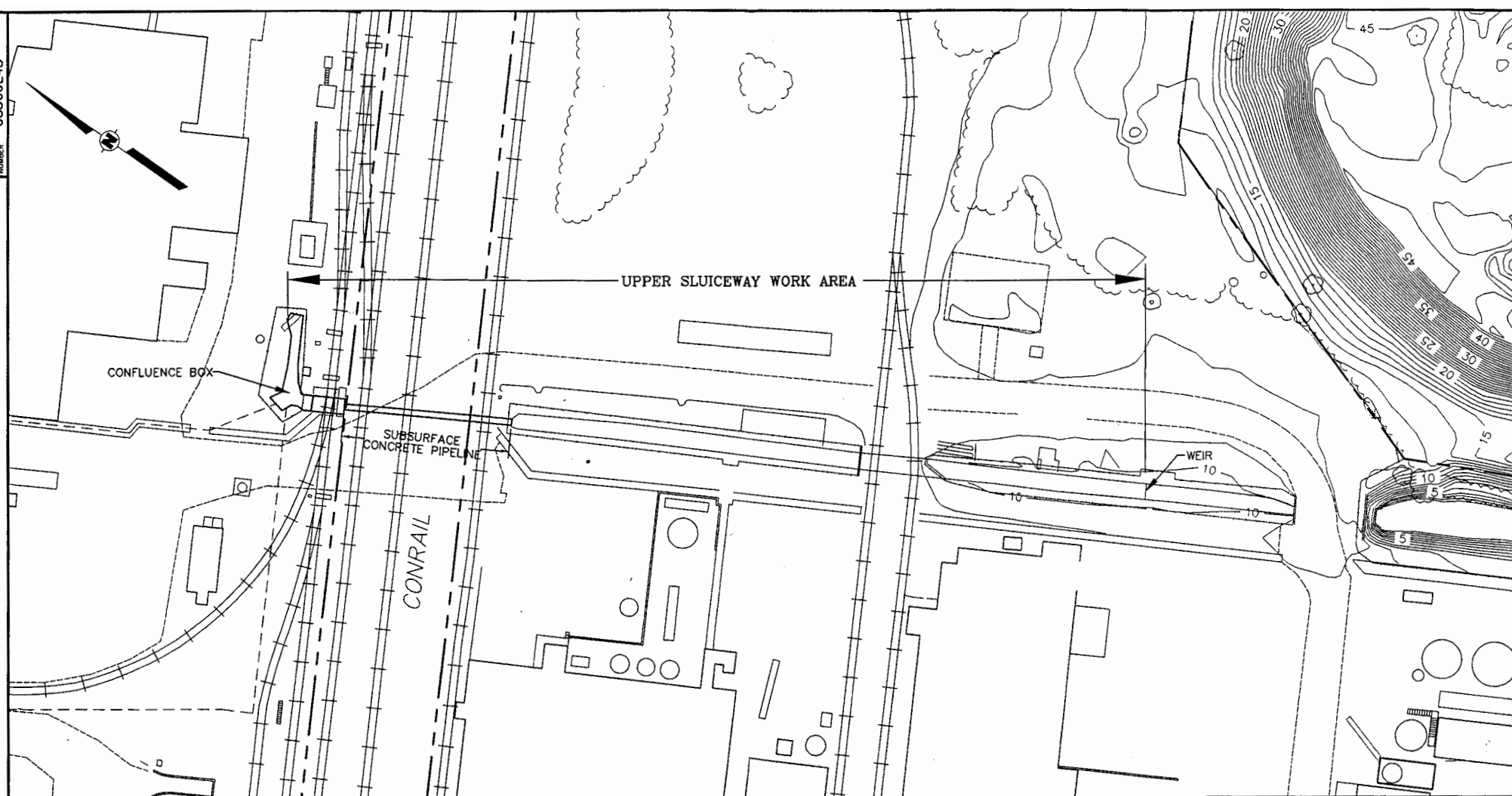


NOTE:
 1. FACILITY GRID IS BASED ON DELAWARE STATE PLANE MERIDIAN, NAD 27.
 2. UPPER SLUICeway WORK AREA IS DEFINED AS THE AREA FROM THE CONFLUENCE PIT TO THE WEIR.

- LEGEND:**
- APPROXIMATE LOCATION OF STORM SEWER LINES
 - - - - - PROPERTY BOUNDARY
 - TOPOGRAPHIC CONTOURS
 - [Hatched Box] SEDIMENT REMOVAL FOR PREPARATION OF CAP AND COVER
 - [Hatched Box] APPROXIMATE LOCATION OF CONTROLLED DENSITY FILL (CDF) PLACEMENT
 - [Solid Black Box] PARTIALLY COLLAPSED PORTION OF SUBSURFACE CONCRETE PIPE

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

CUMMINGS & SMITH, INC. CORPORATE HEADQUARTERS 500 Penn Center Blvd. Suite 500 Philadelphia, PA 19106 (610) 841-6500 Fax: (610) 841-7500		FIGURE 2 UPPER SLUICeway SEDIMENT REMOVAL AND COVER PREPARATION DELAWARE VALLEY WORKS (SOUTH PLANT) CLAYMONT, DELAWARE PREPARED FOR GENTEK, INC. PARLISIPPANY, NEW JERSEY	
SIZE E	SCALE: SHOWN	REV. -	DRAWING NUMBER 03360E42
DRAWN BY: D.S. Marino		DATE: 10-7-13	
CHECKED BY: C.M. Sudd		DATE: 11-21-13	
APPROVED BY: P.F. O'Hara		DATE: 11-27-13	

**NOTE:**

1. FACILITY GRID IS BASED ON DELAWARE STATE PLANE MERIDIAN, NAD 27.
2. UPPER SLUICEWAY WORK AREA IS DEFINED AS THE AREA FROM THE CONFLUENCE PIT TO THE WEIR.

LEGEND:

- APPROXIMATE LOCATION OF STORM SEWER LINES
- PROPERTY BOUNDARY
- TOPOGRAPHIC CONTOURS
- INSTALLATION OF A MINIMUM 6" THICK AQUABLOK® COVER UNDERLAIN BY A LAYER OF GEOTEXTILE



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

GUMMINGS RITER CONSULTANTS, INC. CORPORATE HEADQUARTERS 300 Penn Center Blvd. Suite 500 Pittsburgh, PA 15206 (412) 641-6500 Fax: (412) 641-7600		FIGURE 3 UPPER SLUICEWAY COVER INSTALLATION AREA DELAWARE VALLEY WORKS (SOUTH PLANT) CLAYMONT, DELAWARE PREPARED FOR GENTEK, INC. PARSIPPANY, NEW JERSEY	
SIZE E	SCALE SHOWN	REV. -	DRAWING NUMBER 03360E43
DRAWN BY: D.J. Martino		DATE: 10-7-13	
CHECKED BY: E.M. Bubb		DATE: 11-21-13	
APPROVED BY: P.F. O'Hara		DATE: 11-21-13	

APPENDIX A: PHOTOGRAPHS (ON COMPACT DISK)

**APPENDIX B: SUBSURFACE CONCRETE PIPELINE INSPECTION
VIDEO (ON COMPACT DISK IN APPENDIX A)**